8th Grade Winter Break Packet

1. (8.EE. 1) Which shows (116)2 in exponential form?
	1. 226
	2. 1112
	3. 118
	4. 114
2. (8.EE.1) Which shows 9-3 in standard form?
	1. 729
	2. 27
	3. $\frac{1}{27}$
	4. $\frac{1}{729}$
3. (8.EE.1) Which shows (22)-2 in standard form?
	1. 0
	2. $\frac{1}{16}$
	3. $\frac{1}{8}$
	4. 1
4. (8.EE.1) Which shows 54 in standard form?
	1. 20
	2. 625
	3. 1,024
	4. 3,125
5. (8.EE.1) What is the value of this expression 42 $∙$ 4-3?
	1. $\frac{1}{4096}$
	2. $\frac{1}{1024}$
	3. $\frac{1}{4}$
	4. 4
6. (8.EE.1) Which expression equals x12?
	1. x2 $∙$ x6
	2. x4 $∙$ x3
	3. x11 $∙$ x
	4. x $∙$ x12
7. (8.EE.1) What is the value $\frac{4^{8}}{4^{6}}$ ?
	1. 8
	2. 16
	3. 32
	4. 64
8. (8.EE.1) What is the value of the expression: $\frac{3^{3} ∙ 3^{-4} ∙ 3^{6}}{3^{8} ∙ 3^{-2} ∙ 3^{-5}}$
	1. 5
	2. 81
	3. 243
	4. 729
9. (8.EE.1) Which is an equivalent expression for (32)-5?
	1. -37
	2. -310
	3. $\frac{1}{3^{7}}$
	4. $\frac{1}{3^{10}}$
10. (8.EE.1) Which expression(s) is equal to 2-12?

Expression 1: (2-2 $∙$ 2-8)-2 Expression 2: $\left( \frac{2^{-5}}{2^{-2}∙ 2^{-1}} \right)^{6}$

* 1. Expression 1
	2. Expression 2
	3. Both expression 1 and 2
	4. Neither expression 1 nor 2
1. (8.EE.1) Which expression is equivalent to $\frac{6^{-4}}{6^{-2}}$ ?
	1. 6-6
	2. 6-2
	3. 62
	4. 68
2. (8.EE.1) Which shows $\frac{6^{-1}}{6^{-4}}$ in exponential form?
	1. 6-5
	2. 6-3
	3. 61
	4. 63
3. (8.EE.1) Which expression is equal to (75)-4
	1. 7-20
	2. 7-9
	3. 7
	4. 720
4. (8.EE.2) One side of a triangular garden is $\sqrt{15}$ feet long. Which is the best estimate of the length of the side?
	1. 3.17 feet
	2. 3.18 feet
	3. 3.87 feet
	4. 3.92 feet
5. (8.EE.2) The diagonal of a rectangle measures $\sqrt{5}$ meters long. Which is the best estimate of the length of the diagonal?
	1. 1.9 meters
	2. 2.2 meters
	3. 2.3 meters
	4. 2.5 meters
6. (8.G.2) Which sequence of transformations can map Triangle ABC onto Triangle DEF?
	1. A counterclockwise rotation by 90° about the origin

followed by a reflection across the y-axis

* 1. A counterclockwise rotation by 90° about the origin

followed by a translation down by 2 units

* 1. A counterclockwise rotation by 180° about the origin

followed by a reflection across the y-axis

* 1. A counterclockwise rotation by 180° about the origin

followed by a translation down by 2 units

1. (8.G.2) Which statement is correct about the two figures *PQRST* and *P’Q’R’S’T’*?
	1. They are congruent because figure *P’Q’R’S’T’* is

obtained by reflecting figure *PQRST* across the line y = -1.

* 1. They are congruent because figure *P’Q’R’S’T’* is

obtained by reflecting figure *PQRST* across the line x = 1.

* 1. They are congruent because figure *P’Q’R’S’T’* is

obtained by reflecting figure *PQRST* across the x-axis and

then translating it down by 1 unit.

* 1. They are congruent because figure *P’Q’R’S’T’* is

obtained by reflecting figure *PQRST* across the x-axis

and then translating it down by 2 units.

1. (8.G.2)Which sequence of transformations will map the polygon *ABCD* below onto the polygon *A'B'C'D'*?



* 1. A counterclockwise rotation by 90$°$ about the origin

followed by a translation of 1 unit to the right

* 1. A counterclockwise rotation by 90° about the origin

followed by a translation of 4 units to the right

* 1. A counterclockwise rotation by 180° about the origin

followed by a translation of 1 unit to the right

* 1. A counterclockwise rotation by 180° about the origin

followed by a translation of 4 units to the right

1. (8.G.3) A blueprint of a sailboat has a sail in the shape of a right triangle, *RST.* On the blueprint the vertices are *R*(-4, 6), *S*(-4, 2), and *T*(1, 2). What are the coordinates of the sail after a reflection over the *x*-axis?
	1. R’(-4,6), S’(-4,2), T’(1,2)
	2. R’(-4,-6), S’(-4,-2), T’(1,-2)
	3. R’(6,-4), S’(2,-4), T’(2,1)
	4. R’(-6,-4), S’(-2,-4), T’(2,1)
2. (8.G.3) In Trapezoid *PQRS,* the coordinates of vertex R are (5, -5). What are the coordinates of the image of point *R* after the trapezoid is translated 8 units to the left?
	1. (13,-5)
	2. (-3,-5)
	3. (5,3)
	4. (-5,-5)
3. (8.G.3) The figure*ABCD*below is dilated by a scale factor of $\frac{1}{2}$ to obtain the figure*A'B'C'D'*. Which statement**best**describes the sides and angles of figure*A'B'C'D'*?
	1. $\overbar{A'B'}$ is parallel to $\overbar{C'D'}$ and m∠D'A'B' = m∠DAB.
	2. $\overbar{A'B'}$ is parallel to $\overbar{B'C'}$ and m∠D'A'B' = m∠DAB.
	3. $\overbar{A'B'}$ is parallel to $\overbar{C'D'}$ and m∠D'A'B' = m∠ABC.
	4. $\overbar{A'B'}$ is parallel to $\overbar{B'C'}$ and m∠D'A'B' = m∠ABC.
4. (8.G.3) Triangle *RST*is the result of a dilation of triangle *NPQ* with the center of dilation at the origin and a scale factor of  $\frac{1}{3}$
	1. ∠N is congruent to ∠R.
	2. ∠N is congruent to ∠S.
	3. ∠P is congruent to ∠R.
	4. ∠P is congruent to ∠T.
5. (8.G.3) A point has the coordinates (110, 225). If the point is reflected across the line *y*= 215, what are the coordinates of the reflected point?
	1. (110, 205)
	2. (110, 235)
	3. (110, 440)
	4. (320, 225)
6. (8.G.3) The image of point A after a dilation of 3 is (6, 15).  What was the original location of point A?
	1. (2, 5)
	2. (3, 12)
	3. (9, 18)
	4. (18, 45)
7. (8.G.4) What kind of transformation is a dilation?
	1. A slide of a figure
	2. A turn of a figure around a point
	3. A stretching or shrinking of a figure
	4. A flip of a figure over a line
8. (8.NS.2) Which is closest to the value of $5\sqrt{15}$?
	1. 19.5
	2. 21.0
	3. 8.8
	4. 4.5
9. (8.NS.2) Which is closest to the value of $\sqrt{90}- \frac{4}{11}$?
	1. 7.8
	2. 8.9
	3. 9.1
	4. 9.5
10. (8.NS.2) Which is closest to the value of $\frac{\sqrt{19}}{\sqrt{5}}$ ?
	1. 2.0
	2. 3.8
	3. 4.0
	4. 9.5
11. (8.NS.2) Which is approximately equal to $\sqrt{3}$ ?
	1. $\frac{1}{3}$
	2. 1.732050808…
	3. 3.0
	4. 9.732050808
12. (8.NS.1) Which fraction is equivalent to 0.35?
	1. $\frac{1}{5}$
	2. $\frac{7}{20}$
	3. $\frac{11}{20}$
	4. $\frac{3}{5}$
13. (8.NS.1) Which number below is not an irrational number?
	1. $\sqrt{46}$
	2. $\sqrt{47}$
	3. $\sqrt{48}$
	4. $\sqrt{49}$
14. (8.NS.1) Which is the decimal expansion of $\sqrt{\frac{3}{11}}$ ?
	1. $0.\overbar{34}$
	2. 0.3434
	3. $0.\overbar{27}$
	4. 0.02727
15. (8.G.1) Triangle *ABC*is rotated 90º clockwise to create Triangle *EDC.*



Which angle is congruent to angle B?

* 1. ∠BCE
	2. ∠ECD
	3. ∠E
	4. ∠D
1. (8.G.1) What set of coordinates will provide the vertices for the translation of triangle *XYZ* two units to the left?



* 1. X’(1, 1), Y’(6, 4), Z’(4, -2)
	2. X’(-1, 3), Y’(4, 6), Z’(2, 0)
	3. X’(-3, 1), Y’(2, 4), Z’(0, -2)
	4. X’(-3, 1), Y’(1, 4), Z’(-2, 0)
1. (8.G.1) What set of coordinates will provide the vertices for a 90° clockwise rotation of triangle *JKL* about point *K*?

* 1. J’ (-2, 5) K’ (-2, 1), L’(4, 1)
	2. J’ (-2, 4) K’ (-2, 1), L’(3, 1)
	3. J’ (-2, 5) K’ (-2, 1), L’(3, 1)
	4. J’ (-1, 4) K’ (-2, 1), L’(3, 1)
1. (8.G.1) The measure of angle *LMN* is the same as the measure of angle *L’M’N’*. Use the two figures below, *LMNO* and *L’M’N’O’* to justify why this is correct.



* 1. Figure *LMNO* is rotated 90° counterclockwise about the origin and then reflected across the *x*-axis to obtain figure *L'M'N'O'.*
	2. Figure LMNO is reflected across the x-axis and then rotated 90° counterclockwise about the origin to obtain figure L'M'N'O'.
	3. Figure *LMNO* is rotated 180° counterclockwise about the origin and then reflected across the *y*-axis to obtain figure *L'M'N'O'*.
	4. Figure LMNO is reflected across the y-axis and then rotated 180° counterclockwise about the origin to obtain figure L'M'N'O'.
1. (8.G.1) Triangle ABC is reflected over the x-axis to form triangle A'B'C'.  What are the coordinates of vertex C'?



* 1. (-2, 5)
	2. (-5, 2)
	3. (-5, -2)
	4. (5, -2)
1. (8.EE.1) Strep throat is caused by *Streptococcus* bacteria. The amount of bacteria multiplies at a rate of 1013 per 102 hours.

Part A

What is the average growth of bacteria per hour? Show your work.

Part B

What is the total amount of bacteria present after 103 hours? Show your work.

1. (8.G.2) Part A: Figure *ABCD* is transformed to figure *A’B’C’D’* by first reflecting *ABCD* across the y-axis, and then rotating the resulting figure counterclockwise about the origin by 180 °. Draw the transformed figure *A’B’C’D’* on the grid shown below.



Part B

Figure*A'B'C'D'*is dilated by a scale factor of 3. Explain why the resulting figure will be or will not be congruent to *ABCD.*



1. (8.G.2) The figures to the right,*ABCD* and *PQRS*, are congruent figures.

Part A: Name a sequence of transformations that changes figure *ABCD* to figure *PQRS*

Part B: A student plots four points *K* (0, –3), *L* (–2, –4), *M*(–3, –2), and *N* (–1, 0)
on the grid. Is the figure *KLMN* congruent to the figure *PQRS*? Explain your answer.